# CVGSM, Past, Present, Future

An overview of CVGSM through it's historical progression and a review of the current extension and future work

June 27th, 2003

## Objectives

- Create an application that simulates on a regional scale SW and GW resources of the Central Valley given a comprehensive hydrogeologic database
- Adapt DWR/USBR hydrology development process for estimating land use based demands
- Produce a "common ground" model that can be used by the public and agencies

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## 1st Major CVGSM release, 1990

- Data series from 1922 – 1980
- Includes Tulare, San Joaquin, and Sacramento Valley systems
- Application created by JMM(now MWH), Boyle Engineering, and govt. help from DWR, and USBR.
- Prepared for DWR, USBR, SWRCB, & CCWD

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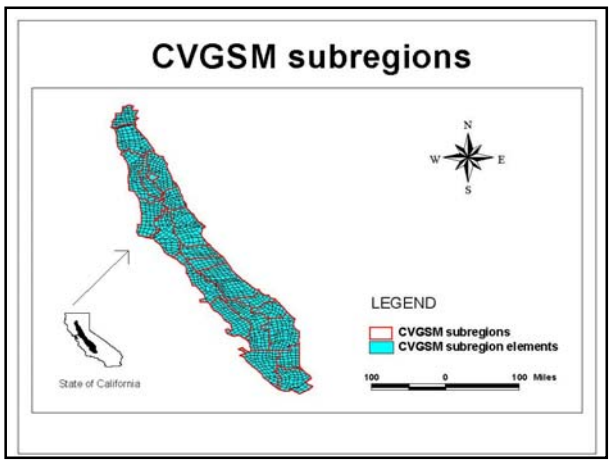


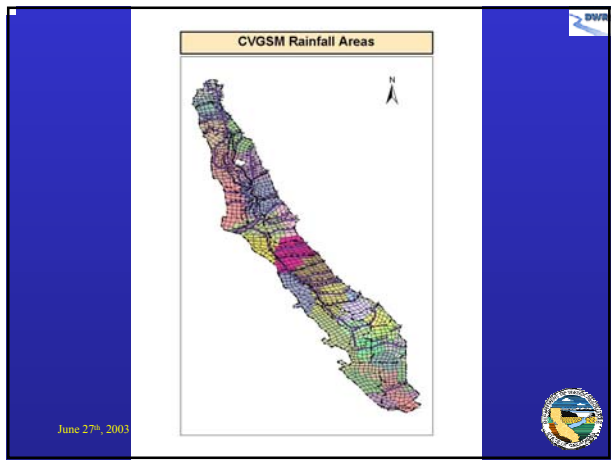


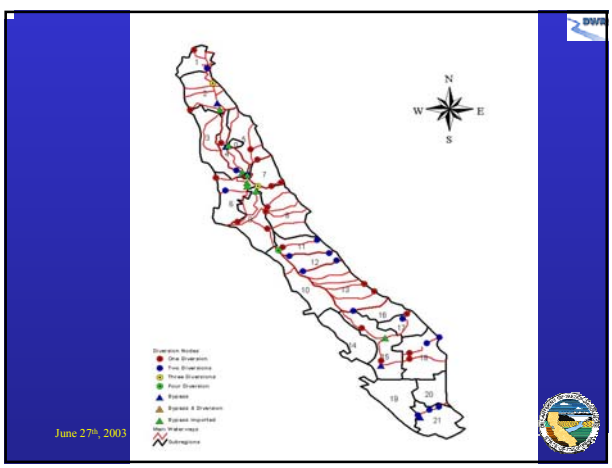


## Progress through the years…

- **1993**: San Joaquin hydrology updated to 1990 as part of USBR FRIGSM. No land use updates, but Sacramento precipitation updated.
- **1995**: USBR contracted to have all data sets updated to 1993 historical. Studies used for CVPIA/PEIS process and as boundary conditions for local applications or other agency models
- **2001-Present**: DWR updated historical data to 1998 and is currently on steps to verify prior to calibration w/r IGSM2

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## Current 1998 extension

- Completed update of historical time series data (Sept. 2002). Includes land use, flows, deliveries, rainfall, demands.
- Documentation is major focal point for re-construction of hydrology to increase public exposure and understanding
- Finish upgrading data procedures for extension and verifying records to prepare for internal review of data with constituents



## Historical Inflows

- Providing all information pertaining to contacts, and source of information
- Any methodology used to calculate flows based on internal calculations from comp model or other relationships are detailed
- Next step is to move towards daily inflow data,….. any **volunteers**?



## Current 1998 extension

- Updated monthly rainfall to daily rainfall to more accurately capture runoff trends
- Revisit important data areas for stratigraphy data, evaporation, efficiency values, diversion and canal losses, factors, and static system characteristics
- Calibration of CVGSM application of IGSM2 using PEST software



## Historical Diversions

- Providing all information pertaining to contacts, and source of information
- Methodologies and calculations are cited for all estimated diversions (riparian values mostly)
- Next step is to add more diversion locations and specific delivery detail

## Land Use / Crop Acreage

- Yearly breakdown of each element by 4 land use types based on adjustment made using Land use surveys and crop acreages
- Updated land use using information provided by DPLA Bulletin 160
- Next step is to create methodology for moving subregional uniformly distributed crop acreages to elementally distributed crop acreages to represent actual land use patterns



## Historic Rainfall

- Providing all information pertaining to contacts, and source of information
- Methodologies and relationships are listed for filling in missing information for daily rainfall data.
- Next step is to add more rainfall stations and or potentially look into external climate models to provide synthetic historic patterns



## AG, UR Demands

- Providing all information pertaining to contacts, and source of information
- Methodologies and calculations are cited for all demands. Option available for internal demand calculations for AG
- Next steps possibly allow users to specify how demands will be met, SW, GW, both, with order or weights associated



## Near future goals

- Complete revised CVGSM database (current boundaries, mesh, components, data requirements)
- **Produce a calibrated CVGSM application**
- Have 2 documentations
  - Detail Central Valley studies and define CVGSM input and analyze CVGSM output; application summary
  - Detailed methodology used to extend hydrology and rework current information for later development, with appendices and spreadsheets

## 1-2 Year Goals

- Update hydrology to reflect ongoing improvements to CALSIM hydrology both in San Joaquin and Sacramento Valleys
- Interfacing CVGSM/IGSM2 with a GUI
- Database options for input/output data with incorporation to GIS software linkages
- Finer mesh discretization and hydrology characteristics in specific regions



## QUESTIONS?!?!



## 1-2 Year Goals

- Updating the Tulare Region hydrology and river networks
- Land use represented as actual crop distribution per element, rather than uniform distribution of crops over subregion
- Potential inclusion of reservoir module with foothill area hydrology